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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Robin J. Guthrie

Serial No.: 10/816,403

Filed: April 1, 2004

Title: Fuel Cell Reactant Flow Fields That  
Maximize Planform Utilization

Docket No.: C-2480

Art Unit: 1795

Examiner: Keith D. Walker

DECLARATION UNDER 37 CFR 1.132Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

I, Robin J. Guthrie declare that:

1. I reside at 7 Lexington Road, East Hartford, CT 06118
2. I have a Bachelor of Science degree in Mechanical Engineering and have been working in the field of fuel cells and related arts for over 33 years, and am currently engaged in that field on behalf of UTC Power Corporation, South Windsor, CT.
3. I have familiarized myself with the subject matter of the above-identified application, as claimed in an amendment filed September 21, 2007.
4. I have familiarized myself with the content of US patent 6,255,011 (Fujii).
5. Claim 1 defines a fuel cell reactant gas flow field plate:
  - grooves form flow channels;
  - the channels conduct fuel in a longitudinal flow direction between inlet ends and outlet ends;
  - the plate has inlet and outlet edges;
  - each channel has a longitudinal inlet portion and/or a longitudinal outlet portion, extending respectively from the inlet edge or the outlet edge;
  - each channel has a portion transverse to the longitudinal flow direction and connected to an inlet portion and/or an outlet portion;
  - the transverse portions may have more than one groove.

6. References to columns (e.g. 7) and lines (e.g. 41-43) will hereinafter be made thusly (7:41-43).

7. Fig. 6 of Fujii has inlet grooves 44a-44f extending in the horizontal direction from the fuel inlet 36a (3:54, 55) and has outlet grooves 50a-50f extending in a horizontal direction to the fuel gas outlet 36b (4:2-4).

8. *"... fuel gas passes through the first gas flow passage grooves 44a-44f, and it is smoothly and uniformly merged into the first and second united sections 92, 94". (7:41-43)*

9. *"The flow passage cross-sectional area is increased as the first gas flow passage grooves 44a-44f are merged (in the downward direction)." (7:35-37) (Emphasis added)*

10. Merriam-Webster's Collegiate, 11<sup>th</sup> edition, defines "transverse" as "at right angles to the long axis of a body." "Downward" in Fujii is at right angles to "horizontal" in Fujii.

11. From the facts set forth in the portions of Fujii cited in paragraph 7-9 above, it is clear that Fujii conducts fuel in horizontal inlet portions 44a-44f and in horizontal outlet portions 50a-50d which are connected by downward united sections 92, 94.

12. The downward direction is in the direction of arrow A in Fig. 6 parallel with the short side, and the horizontal direction is in the direction of arrow B parallel with the long side (3:1-5).

13. The grooves 44a-44f, 50a-50d in Fujii therefore conduct *"reactant gas along a longitudinal flow direction extending between said inlet ends and said outlet ends."* (Claim 1, lines 3 and 4)

14. Fujii's plate 90 has an inlet edge, near inlet 36a, and an outlet edge, near outlet 36b.

15. Fujii's grooves 44a-44f comprise channels *"extending longitudinally from...near said inlet edge...."* (claim 1, lines 6 and 7)

16. Fujii's grooves 50a-50d comprise channels *"extending longitudinally from...near said outlet edge...."* (claim 1, lines 7 and 8)

17. Fujii has a transverse portion 94 for three inlet grooves 44a-c, connecting them to two outlet grooves 50c, 50d, and has a transverse portion 92 for three inlet grooves 44d-44f, connecting them to two outlet grooves 50a, 50b.

18. The channels of paragraphs 15 and 16 above (44a-44f, 50a-50d) do NOT each have *"a transverse portion extending substantially transversely of said longitudinal direction and in fluid communication either (c) with only one of said inlet portions or only one of said outlet portions, or (d) between one of said inlet portions and one of said outlet portions...."* (Claim 1, lines 8-11)

19. If one were to consider Fujii's grooves 44a-44c as one channel and grooves 44d-44f as a second channel, then one channel has a single transverse groove 94 and the second channel has a single transverse groove 92; this does meet: *"some...transverse portions having more than one groove."* (Claim 1, line 13)

20. If the vertical portions of grooves 50a and 50b, or of grooves 50c and 50d, were considered to be the transverse portions, this would not meet *"but less than all having more than one groove"*. (Claim 1, line 13)

21. It is evident from the facts set forth in paragraphs 7-20 that there is no construction of Fujii that has *"some, but less than all of said transverse portions having more than one groove"* as called for in line 13 of claim 1.

22. All statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Robin J. Guthrie  
Robin J. Guthrie

April 3, 2008  
Date